IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: James Leonard Smith **DATE:** February 15, 2005

SERIAL NO.: 09/856,781 **GROUP ART UNIT:** 3635

FILED: September 20, 2001 **EXAMINER:** Katcheves, Basil S.

FOR: "Load Bearing Structures"

ATTORNEY DOCKET NO.: A01105US (98486.2)

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DECLARATION

My name is John Elson, and I make this declaration as a person skilled in the art of technology related to the subject matter of the invention disclosed and claimed in U.S. Application No. 09/856,781, as follows:

1. I obtained a Masters Degree in Industrial Design (Engineering) from the Royal College of Art in 1968, and received Fellowship of the Chartered Society of Designers in 1977.

2. My previous employment in the design field has included acting as Design and Development Value Analysis Coordinator for the Inner London Education Authority, London, United Kingdom, and as Product Design and Development Coordinator for the United Kingdom Post Office.

3. Since 1984 I have been managing director of my own consultancy company, JEDCo Product Designers Ltd. My consultancy work involves advising on New Product Development and Design for a wide range of industries, including Housewares, Domestic Electrical Appliances, Medical, Transport Infrastructure, Architectural Fittings and Building Construction.

4. I have developed a number of design ideas which have resulted in patents being granted in my name.

5. I have been a member of the Professional Practice Committee of the Chartered Society of Designers, and have been called on as an expert witness in legal cases.

6. I have received a number of awards for my work, most recently the Lighting Design Award 2004 for Contribution to Sustainability, for development work on a self-powered illuminated bus stop for London Transport.

7. I am a permanent visiting lecturer at Kingston University, School of Design, Kingston, Surrey, United Kingdom, where I specialise in New Product Development, Researching Sustainability, and Recyclability of Materials.

8. In 1997 I was commissioned to evaluate the feasibility of manufacturing a 'plastics scaffold board'. Later I was retained to advise on the development of the design through to manufacture.

9. During this time I have thoroughly researched the manufacturing options, commercial requirement, expectations/ aspirations of the Construction industry, and existing knowledge. As such I have developed a depth of experience and can be described as an expert within this field.

10. The concept of a 'plastics scaffold board' is one of those long sought-after but never achieved ideas for the construction industry. It could be described as a 'Holy Grail' of the Industry. In the absence of a plastics board the Industry continues using timber.

11. The attractiveness of a plastics board to the Industry is that it would undoubtedly be:
(1) lighter and therefore more handleable under hazardous conditions,
(2) safer to use as it would not splinter like timber,
(3) more robust as it would not deteriorate when in use or storage in the way that timber rots – the Industry expects the life span of a board to be between 6 to 18 months, after which they are considered generally unserviceable.

12. Given these benefits, it is then surprising that a plastic scaffold board has not yet been successfully developed by the Industry. The main reason is that, until now, the combination of lightness, limited deflection under loading, and cheapness of manufacture has not been achieved within the profile dimensions required by the Industry.

13. The manufacturing options, suitable for achieving a light, high modulus profile, that were initially considered were:
blown extruded thermoplastics,
hollow pultrusion,
hollow plastic extrusion.

14. Blown Extruded Thermoplastics involves extruded blown commingled thermoplastic has been commonly used for plastic lumber for over 12 years in the US and 8 years in the UK. This process is as described in STUCKY. However, it is common knowledge in this industry that even with thermoplastics modulus improvers, such as glass fibres, the deflection of sections under loading is very large. This modulus limitation is as described by STUCKY, where the <u>maximum</u> modulus that he expected (see col. 2, lines 15 to 18) is significantly below that required for a 'scaffold board' (whose deflection is specified in International Standards, for example, EN 12811).

15. The other issue that is understood by those in this Industry is that its mass/modulus ratio is too high. Thus, even using the stiffest possible reinforced blown thermoplastics at its maximum modulus, the mass of a profile, as specified by International Standards, would be expected to be too heavy to be acceptable to the industry.

16. Hence the plastics lumber industry has not been able to penetrate the potentially very lucrative scaffold board market.

17. Hollow Pultrusion - If cost was no consideration, this would be the ideal option, as very strong hollow sections are achievable. However, it is well known that this process, which demands first quality continuous glass filament and plastics resin (typically epoxy or polyester), is very expensive. This process is fundamentally as described in HEIKKILA.

18. A pultruded scaffold board had been produced by NOVA PLASTICS, Canada, but is now no longer available. It had been offered for sale within the UK at a cost of GBP 34/ linear M. This is considered far too expensive as the price of a timber board is GBP 1.5/ linear M.

19. Hollow Extrusion, until the present invention, had never been successfully employed. General experience with extruded thermoplastics with modulus enhancing additives, such as chopped glass fibre, is that the extrusion process is not satisfactory in achieving either good distribution or length of fibre in order to significantly achieve a high modulus.

20. The applicant's invention provides a hollow load bearing structural element which can be made in a single step process by extrusion from a thermoplastics plastics material which is compounded with a chopped glass fibres in such a way that the element has a high flexural modulus typically exceeding 8000MPa.

21. Neither Stucky nor Heikkila disclose or suggest a hollow load bearing structural element consisting solely of a body extruded from a thermoplastics plastics material which is compounded with chopped glass fibres in such a way that the element, without the need for further reinforcement exterior to the body, has a flexural modulus of 4000Mpa or above.

22. Furthermore, the invention satisfies a long felt want for inexpensive plastic scaffolding boards in the construction industry. From the beginning of manufacture in 2002, over 300,000 metres of plastic scaffold board have been manufactured, amongst the customers are:
Bow Scaffolding for Inland Revenue HQ, SGB Scaffolding Great Britain for BNFL, Burn Brothers for new Wembley Football Stadium, Stevensons Building Contractors for general house building, Trad Scaffolding, Cape Plc for Scottish Power.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Signed this 15 **day of February, 2005.**

John E Elson MDesRCA FCSD

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DECLARATION

My name is James Leonard Smith, and I make this declaration as inventor of, and a person skilled in the art of technology related to, the subject matter of the invention disclosed and claimed in U.S. Application No. 09/856,781, as follows:

1. I graduated in Civil Engineering from the University of Manchester, UK, and am an associate member of the British Association of Civil Engineers.

2. After graduating I was employed for 10 years as a civil engineer with a UK firm of civil engineers, Shepherd Hill.

3. After leaving Shepherd Hill I had my own building company for 10 years, after which I retired.

4. During my work as a civil engineer with Shepherd Hill and in my own building company I experienced a need for a low cost, lightweight alternative to timber scaffolding boards.

5. Some years later, at the time of the invention, there was still a long felt want in the construction industry for a low cost plastics scaffolding board which met the desired strength and weight requirements and could therefore be a suitable replacement for timber scaffolding boards.

6. In considering how to achieve this, I initially looked into three manufacturing techniques: blown extruded thermoplastics, hollow pultrusion and hollow plastic extrusion.

7. After determining that the technique of blown extruded thermoplastics could not result in a lightweight board of sufficient strength, and that the technique of hollow pultrusion was too expensive, I considered the technique of hollow plastic extrusion with modulus enhancing additives.

8. I experimented with hollow extrusion processes and identified glass fibre as the best

available additive. However, analysis of extruded sections found that the fibres had been broken down, under the extreme heat and pressure of the process, into very small fibre lengths.

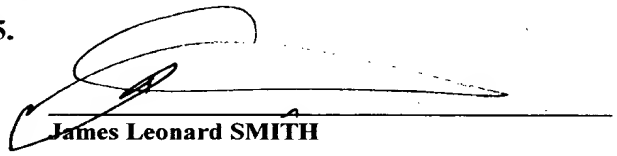
9. Having identified the basic problem as being the breakdown of glass fibres during the extrusion process, it occurred to me that if the fibres could be introduced very late into the molten thermoplastic, the fibres may not be so badly damaged. However, at the time of the invention it was generally considered by those skilled in the art that if the fibres were added very late they would not be sufficiently mixed within the matrix.

10. I was also looking to obtain production cost benefits through use of an in-line compounding solution, as opposed to the traditional method of using expensive (and ineffective) pre-compounded glass reinforced granules. I identified one such in-line process, now known as Flowlab, from WO 97/42019, but noted that the particulate matter was added late in the process.

11. Nevertheless, I decided to experiment with the Flowlab process and, contrary to my expectation, found that the process allowed good dispersion of the fibres and provided surprisingly significantly enhanced modulus characteristics of the scaffold board section.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Signed this 15 day of February, 2005.



James Leonard SMITH